

United States Department of Agriculture,

DIVISION OF AGROSTOLOGY.

(GRASS AND FORAGE PLANT INVESTIGATIONS.)

F. LAMSON-SCRIBNER, *Agrostologist.*

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U. S. Department of Agriculture. AGROSTOLOGICAL NOTES.

INTRODUCTION.

Agrostological Notes was the general title of Circular No. 27 which contained several short papers of purely technical nature and the same title is here adopted for a series of papers of similar character as follows:

1. Some Species of Grasses published by S. B. Buckley.
2. Notes on *Calamovilfa*.
3. Three New Species of *Panicum*.
4. A new Species of *Poa*.
5. Some Changes in Nomenclature.

1. SOME SPECIES OF GRASSES PUBLISHED BY S. B. BUCKLEY.

By ELMER D. MERRILL.

In 1866 Mr. S. B. Buckley published a small octavo volume of 81 pages, with an appendix of 4 pages, that was issued from the office of the "State Gazette" at Austin, Texas, under the title "A Preliminary Report of the Geological and Agricultural Survey of Texas." The appendix, which is paged separately, is the part of the report of interest to agrostologists. In it one genus and nine species of Texan grasses, supposed by the author to be new, are described. These species, which for some reason were not included in Index Kewensis, are as follows:

Schleropelta Buckley, Prel. Rept. Geol. and Agrl. Surv. Texas, App. 1. 1866.
=*Hilaria* H. B. K. Nov. Gen. et Sp. Pl. 1: 116. 1815.

Schleropelta stolonifera Buckley, l. c.=*Hilaria cenchroides* H. B. K. l. c. 117.

Pappophorum (Polyrhapis) vaginatum Buckley l. c. This is the earliest publication of this species and Buckley's name should be retained. *Pappophorum apertum* Munro in Scribn. Bul. Torr. Bot. Club, 9: 148. 1882, is a synonym. See Merrill, U. S. Dept. Agr. Div. Agros. Cir. 32: 9. 1901.

Cenchrus setoides Buckley, l. c., 2=*Cenchrus myosuroides* H. B. K. Nov. Gen. et Sp. Pl. 1: 115. t. 35. 1815.

Calamagrostis (Deyeuxia) longirostris Buckley, l. c. "Culm erect, a little scabrous, half a foot high, sheaths a little scabrous, and about equal to the internodes; ligula elongate, membranaceous and subentire; leaves plain or convolute, scabrous, shortly pubescent above, 4 to 6 inches long, and 2 to 3 lines broad; panicle terminal, somewhat open and interrupted, 3 to 5 inches long and 8 to 12 lines broad; rachis terete, pubescent; glumes subequal, lanceolate, acute, longer than the florets, scabrous on the back, margins and apex hyaline; upper 1 to 3 nerved, lower palea 3 to 5 nerved, shortly pilose at the base, hyaline upon the margin, apex bifid, below the middle long aristate; awns twisted, jointed and double the length of the florets; lower internodes of the rachis about 8 lines in length; upper intervals 2 to 3 lines long; long estrays naked near their bases and densely spiked near their summits; spikelets about 3 lines long."

The identity of this species is in doubt.

Panicum (Tridachne) *saccharatum* Buckley, l. c., 2. This name should be retained. *Panicum lachnanthum* Torr. 1857, not Hochst. 1855, is a synonym.

Panicum glomeratum Buckley, l. c., 3. = *Panicum platyphyllum* Munro. Buckley's description antedates that of Munro, but the name *Panicum glomeratum* is preoccupied by *Panicum glomeratum* Moench, 1794, et al.

Panicum texanum Buckley, l. c., 3. This is a distinct species and, so far as known, has no synonyms.

Panicum repente Buckley, l. c., 3. = *Panicum obtusum* H. B. K. Nov. Gen. et Sp. Pl. 1: 98. 1815.

Panicum ciliatissimum Buckley, l. c., 4. A very distinct and well-marked species.

2. NOTES ON CALAMOVILFA.

By F. LAMSON-SCRIBNER and ELMER D. MERRILL.

CALAMOVILFA GIGANTEA (Nutt.) n. comb. *Calamagrostis gigantea* Nutt. Trans. Am. Phil. Soc. II, 5: 143. 1837.

A stout, erect glabrous perennial, 10 to 20 dm. high, from a stout creeping root-stock, with rigid involute leaves and large, open panicles. Sheaths exceeding the internodes, glabrous; ligule a dense ciliate fringe of hairs about 1 mm. long; leaf-blades about 3 dm. long, glabrous. Panicles 3 to 7 dm. long, the branches spreading or ascending, the lower ones often 3 dm. in length, naked below, flower-bearing toward their extremities. Spikelets 8 to 10 mm. long; empty glumes unequal, glabrous, acute, the first shorter than the second. Flowering glume about 8 mm. long, glabrous above and on the margins, pilose below on both sides of the keel with rather long, appressed white hairs, basal hairs copious, about one-half as long as the glume. Palea about equaling the flowering glume, pilose along the margins, otherwise glabrous.

The type specimen in the herbarium of the Philadelphia Academy of Natural Sciences is ticketed by Nuttall: "*Toxeumia gigantea*, *Calamagrostis* Nutt., Arkansas, Salt River." This specimen, although covering the entire sheet, represents but little more than the panicle of the plant. The entire plant must have been very large. The panicle is over 2 feet long, and the wide-spreading branches more than 1 foot in length, which are flower-bearing toward their extremities, naked below. In many of the spikelets on this specimen the empty glumes are about equal; in others, the second is often slightly longer than the first—10 mm. long, or somewhat less. The flowering glume and palea are equal, the former being pilose-pubescent on the back for two-thirds its length, the latter pilose-pubescent on the margins.

General distribution in sandy soil, Kansas to Arizona, July to October.

SPECIMENS EXAMINED.—*Kansas*: Moonlight, 183 C. H. Thompson, August 15, 1893; Riley County, 904 J. B. Norton, 1896; Stevens County, 344 M. A. Carleton, July, 1891. *Oklahoma Territory*: Kay County, Mark White, July 23, 1898. *New Mexico*: No locality or collector given. 1882. *Arizona*: Holbrook, H. H. Rusby, August, 1883; San Francisco Mountains, Loew, 1873; Chalcedony Park, Myrtle Tuck, October 15, 1897; Moki Reservation, 41 Walter Hough, 1896.

This species was recognized by Torrey in Marcy's Explor. Red Riv., La. 300. 1853, and also in Pac. R. R. Rept. 4⁵: 154. 1857, but was later reduced to *Calamagrostis longifolia* by Gray. It is closely related to *Calamovilfa longifolia* (Hook.) Hack., and all the specimens cited above have been so referred in herbaria. It is distinguished, by its larger size, large, open panicles, elongated branches, larger spikelets, and in the pilose flowering glume and palea.

Calamovilfa longifolia (Hook.) Hack. True Grasses, 113. 1890; *Calamagrostis longifolia* Hook. Fl. Bor. Am. 241. 1840; *Vilfa rigida* Buckl. Proc. Acad. Nat. Sci. Phila. 1862: 89. 1862; *Ammophila longifolia* Benth. in Vasey, U. S. Dept. Agr. Spec. Rept. 63: 29. 1883.

This species extends from Western Ontario and Indiana westward to Wyoming, Montana, Idaho, and southward to Iowa, Nebraska, and Colorado. It is distinguished by its usually contracted panicles and glabrous flowering glume and palea.

CALAMOVILFA LONGIFOLIA MAGNA var. nov. This variety is distinguished from the species mainly by its large size, 12 to 18 dm. high; in this respect approaching *Calamovilfa gigantea*, but distinguished from that species by its glabrous spikelets. It is represented in the National Herbarium by specimens collected on the lake shore at the mouth of the Kalamazoo River, Mich., by W. A. Taylor in 1894. It is very abundant and valuable as a sand binder in the dunes about South Haven and Grand Haven, Mich.

3. THREE NEW SPECIES OF PANICUM.

By F. LAMSON-SCRIBNER and ELMER D. MERRILL.

PANICUM (VIRGARIA) BARTOWENSE sp. nov.

Panicum proliferum pilosum Griseb. Pl. Cub. 232. 1866. ? Not *Panicum pilosum* Swartz, 1788, et al.

A stout, erect annual 12 to 16 dm. high, with very long leaves, tuberculate-hispid sheaths and diffuse panicles 3 to 6 dm. long. Culms simple, glabrous, 5 to 7 mm. in diameter below. Sheaths about equaling or somewhat exceeding the internodes; ligule a ciliate fringe about 2 mm. long; leaf-blades 4 to 6 dm. long, about 10 mm. wide, tapering to the acute apex, scarcely narrowed at the rounded and somewhat clasping base, scabrous on the margins and on the nerves above, glabrous beneath, or often with few scattered papillate hairs on both surfaces. Panicles pale or purplish, the branches at first erect, finally spreading, the lower ones 3 to 4 dm. long; the primary axis and branches scabrous. Spikelets nearly 2.5 mm. long, narrowly ovate, acute, glabrous; first glume truncate, enclosing the base of the spikelet, less than 0.5 mm. long; second and third glumes subequal, acute, slightly exceeding the flowering glume, both 7-nerved, the nerves rather prominent, the third glume subtending a hyaline palea about 1 mm. long; flowering glume less than 2 mm. long, ovate, acute, smooth and shining.

Type specimen collected in wet, reclaimed swamps at Bartow, Polk County, Fla. No. 1220, Robert Combs, September 29, 1898; No. 971, Combs, collected in a water ditch at Homosassa, Citrus County, Fla., September 13, 1898, is the same; No. 483, A. S. Hitchcock, collected in inundated fields, Myers, Lee County, Fla., July-August, 1900, represents a later stage of the species with a very diffuse, open panicle; No. 5386, A. H. Curtiss, low grounds, Palm-beach, Fla., May 13, 1895, belongs here.

This species is closely related to *Panicum proliferum* Lam., the most striking difference being its tuberculate-hispid sheaths and very small first glume.

PANICUM SHASTENSE sp. nov.

A tufted, pubescent perennial about 3 dm. high, with erect or ascending leaves and open, ovate, rather few-flowered panicles. Culms geniculate below, pilose with scattered long white hairs; nodes bearded with spreading or reflexed hairs and with a smooth ring immediately below. Sheaths close, striate, shorter than the internodes, pilose with long spreading hairs; ligule a ciliate fringe about 2 mm. long; leaf-blades narrowly lanceolate, acute, slightly clasping at the base, 5 to 7 cm. long, 6 to 8 mm. wide, pilose beneath with weak spreading hairs, nearly glabrous above, scabrous on the margins.

Panicles about 8 cm. long, rachis and branches sparingly pilose, branches fasciculate at the nodes, ascending, few-flowered. Spikelets ovate, obtuse, 2.5 mm. long, pale, or purplish at the base, first glume triangular, pubescent, less than 1 mm. long; second and third glumes about equal, densely pubescent with short spreading hairs, the third glume enclosing a hyaline palea a little over one-half as long as the glume; flowering glume ovate, 2 mm. long.

Type specimens collected in a moist meadow at the edge of pine forests at Castle Crag, near Mt. Shasta, California, by Louis A. Greata, June, 1899.

Related to the common and widely distributed *Panicum unciphyllum* Trin. (*P. pubescens* of authors, not Lamarck), but is at once distinguished by its larger spikelets. In some respects it resembles *Panicum scribnerianum* Nash, but it is not closely related to that species.

PANICUM FUNSTONI sp. nov.

A slender tufted, nearly glabrous perennial 4 to 7 dm. high, with numerous, ascending leaves, slender erect culms, exserted ovate panicles and small spikelets. Culms at first simple, becoming much branched, sparingly appressed-pubescent or glabrous. Sheaths shorter than the internodes, striate, glabrous except on the ciliate margins; ligule a prominent fringe of hairs 3 mm. long, leaf-blades narrowly lanceolate, those of the primary culm 5 to 7 cm. long, 6 to 8 mm. wide, acute, slightly clasping at the base, glabrous except on the scabrous margin which is often papillate ciliate at the base, those of the branches much smaller, crowded, the upper ones often minutely puberulent beneath. Panicles 4 to 5 cm. long, ovate, the rachis and branches glabrous; secondary panicles small, few-flowered, mostly enclosed in the upper sheaths. Spikelets ovate, 1.5 mm. long or slightly less; first glume very small, less than 0.5 mm. long; second and third glumes rather densely pubescent with short spreading hairs, the second slightly shorter than the flowering glume.

Type specimen collected on the bank of Kaweah River at Three Rivers, Tulare County, Cal., No. 1286, Coville & Funston, July 26, 1891. No. 142 Dr. Ezra Michener, Sacramento, Cal., August 31, 1894, is also referred here, although it differs from the type in its more lax habit of growth, thinner leaves and glabrous culms.

This species is very distinct from any other from the Pacific slope, and is apparently not closely related to any of those of the Eastern States. It is distinguished by its tall, slender culms, numerous crowded leaves on the branches, and small pubescent spikelets, the second glume being shorter than the flowering glume. We take pleasure in naming it for General Funston who first collected it.

It is the *Panicum dichotomum* of the Botany of the Death Valley Expedition, Contr. U. S. Nat. Herb. 4: 216. 1893.

4. A NEW SPECIES OF POA.

POA APERTA Scribn. & Merrill sp. nov.

A lax, loosely tufted, glabrous, glaucous, perennial, 4 to 5 dm. high, from creeping rootstocks, with wiry spreading culms, linear leaves and open, few-flowered panicles 4 to 8 cm. long. Culms terete, branching below, geniculate and rooting at the lower nodes. Sheaths striate, the lower ones marcescent, crowded; ligule membranaceous, acute, 2 to 3 mm. long, decurrent as a rather prominent white sheath margin; leaf-blades rather firm, striate, minutely scabrous, glaucous, acute, those of the innovations 10 to 16 cm. long, about 2 mm. wide, those of the culm shorter. Panicle exserted, ovate in outline, rigid, branches spreading or reflexed, scabrous, the lower ones 2 to 2.5 cm. long, bearing about 3 spikelets, the upper ones solitary, shorter.

Spikelets purplish, lanceolate-ovate, acute, 5 to 6 mm. long, 3 to 4-flowered; empty glumes, lanceolate, acute, glabrous except for the slightly scabrous keel, slightly unequal, the first 3.5 mm. long, the second somewhat broader, 4 mm. long; flowering glumes lanceolate, minutely pubescent throughout and prominently webby-hairy on the keel and lateral nerves below.

Type specimen collected at Telluride, Colo., No. 98, C. L. and Wm. Shear, September 1, 1900, occasional in small loose tufts, on moist open mountain sides. Altitude 2940 m.

This species bears a striking resemblance to *Poa compressa* L., in habit of growth, but otherwise is not closely related to that species. It is readily distinguished by its terete culms, rigid, spreading or reflexed panicle branches, and spikelet characters.

5. SOME CHANGES IN NOMENCLATURE.

By ELMER D. MERRILL.

Panicum striatum (Linn.) Lam. Tabl. Encycl. 1: 172. 1791; Encycl. 4: 738. (err. typ., 748. 1797.); *Holcus striatus* Linn. Sp. Pl. 1048. 1753; Gronov. Fl. Virg. 135. 1739; *Panicum gibbum* Ell. Sk. Bot. S. C. and Ga. 1: 116. 1817; *Panicum aquaticum* Muhl. Gram. 126. 1817; *Panicum* Muhl. l. c. 127. No. 39 (sine nomine); *Panicum tremulum* Schultes, Neue Ent. 2: 103. 1821; Mant. 2: 237. 1824; Syst. 1: 319. 1825; *Panicum elliotianum* Schultes Mant. 2: 256. 1824; *Panicum hydrophilum* Schultes l. c., 237.

While Lamarck does not mention *Holcus striatus* Linn., in connection with his *Panicum striatum*, his description is so ample as to leave no doubt as to the identity of the plant he had in mind. Munro¹ says, "*Holcus striatus* Gronov. Virg. 135, is *Panicum gibbum* Ell." The descriptions of both Gronovius and Linnæus apply to this species. *Panicum elliotianum* was applied to this species by Schultes, as he believed Elliott's name to be preoccupied by *Panicum gibbosum* R. Br. *Panicum hydrophilum* Schultes, was based on *P. aquaticum* Muhl., which is the same as Elliott's *Panicum gibbum*.² *Panicum tremulum* Schultes, was based on *Panicum* No. 39 Muhl. Gram. 127 (sine nomine), and although this species is not represented in Muhlenberg's herbarium we do not hesitate in referring it to *Panicum striatum*. Muhlenberg queries "An varietas *P. aquatici*? sed folia multum angustioria."

Panicum hemitomum Schultes, Mant. 2: 237. 1824. (*Panicum dimidiatum* Walt. Fl. Carol. 72. 1788, not Linn. 1753; *Panicum walteri* Muhl. Gram. 108. 1817; Ell. Sk. Bot. S. C. and Ga. 1: 115. 1817, not Pursh, 1814; *Panicum carolinianum* Spreng. Syst. Veg. 1: 310. 1825; *Panicum carinatum* Torr. Boston Journ. Nat. Hist. 1: 137. 1835. *Panicum digitarioides* Carpenter, Steud. Syn. Pl. Gram. 75. 1854; *Panicum curtissii* Chapm. Fl. So. U. S. 573. 1860.

From examination of the herbaria of Muhlenberg and Elliott, it was found that *Panicum walteri* of both these authors is the grass now known as *Panicum digitarioides*.³ *Panicum hemitomum* Schultes, was based on *P. walteri* Muhl., and is the earliest available name. *Panicum carolinianum* Spreng., published one year later was based on *Panicum walteri* Ell. which is the same as Muhlenberg's *Panicum walteri*. Both of these names antedate *Panicum digitarioides* Carpenter, which in any case is untenable as it is antedated by *P. digitarioides* Raspail, Kunth. Enum. 1: 53. 1833.

¹ On the identification of the Grasses of Linnæus's Herbarium, Journ. Linn. Soc. Bot. 6: 53. 1862.

² Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Cir. 27: 4. 1900.

³ U. S. Dept. Agr. Div. Agros. Cir. 27: 2. 1900. Ibid. Cir. 29: 4. 1901.

SPOROBOLUS COMPOSITUS (Poir.) n. comb. *Agrostis compositis* Poir. in Lam. Encycl. Suppl. 1: 254. 1810; *Agrostis involuta* Muhl. Gram. 72. 1817; *Agrostis longifolius* Torr. Fl. U. S. 1: 90. 1824; *Sporobolus longifolius* Wood, Class-book, 775. 1861; *Sporobolus asper* Vasey, Contr. U. S. Nat. Herb. 3: 59. 1892, not Kunth. 1833.

Agrostis composita Poir., based on a specimen collected by Bosc in "Caroline," is evidently the earliest available name for this species, and is here taken up. *Agrostis involuta* Muhl. has been previously referred to *Sporobolus asper*, but according to the specimens in Muhlenberg's herbarium and to his description, it is identical with the form described by Torrey as *Agrostis longifolia*, which it antedates.

Bromus pubescens Muhl. in Willd. Enum. 120. 1809; Gram. 169. 1817.

This species, according to the specimen so labeled in Muhlenberg's herbarium, now deposited in the Philadelphia Academy of Natural Sciences, is identical with *B. purgans* Linn., and should be cited as a synonym of that species.

Bromus scabratus Scribn., U. S. Dept. Agr., Div. Agros., Bul. 13: 46. 1898, is a synonym of *Bromus porteri* (Coult.) Nash. It is based on No. 3800 A. Nelson, Vermillion Creek, Wyo., July 20, 1897.

The above names were not cited in Bulletin No. 23, in which the North American species of *Bromus* are monographed.

Chaetochloa hispida Scribn. & Merrill, U. S. Dept. Agr., Div. Agros., Bul. 21: 25, fig. 13. 1900.

This species was based on a single specimen collected in Cuba by C. Wright, January, 1865, but has recently been collected in Florida by A. S. Hitchcock, No. 915, shell mounds, Marco, Lee County, July-August, 1900. This specimen is somewhat larger than the type, about 9 dm. high, with slightly larger spikes, but otherwise the same.

Phalaris paradoxa Linn. Amoen. Acad. 4: 264. 1759; Sp. Pl. ed. 2. 1665. 1763.

This species has been introduced into California and is represented by specimens collected near Princeton, Colusa County, by J. Burtt Davy, May, 1898, and at San Diego by T. S. Brandege, January, 1901. It is considered by Jepson, in his "Flora of Middle Western California," and is apparently quite widely distributed in that State. It is a native of Mediterranean region of Europe, Africa, and Asia.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., June 4, 1901.